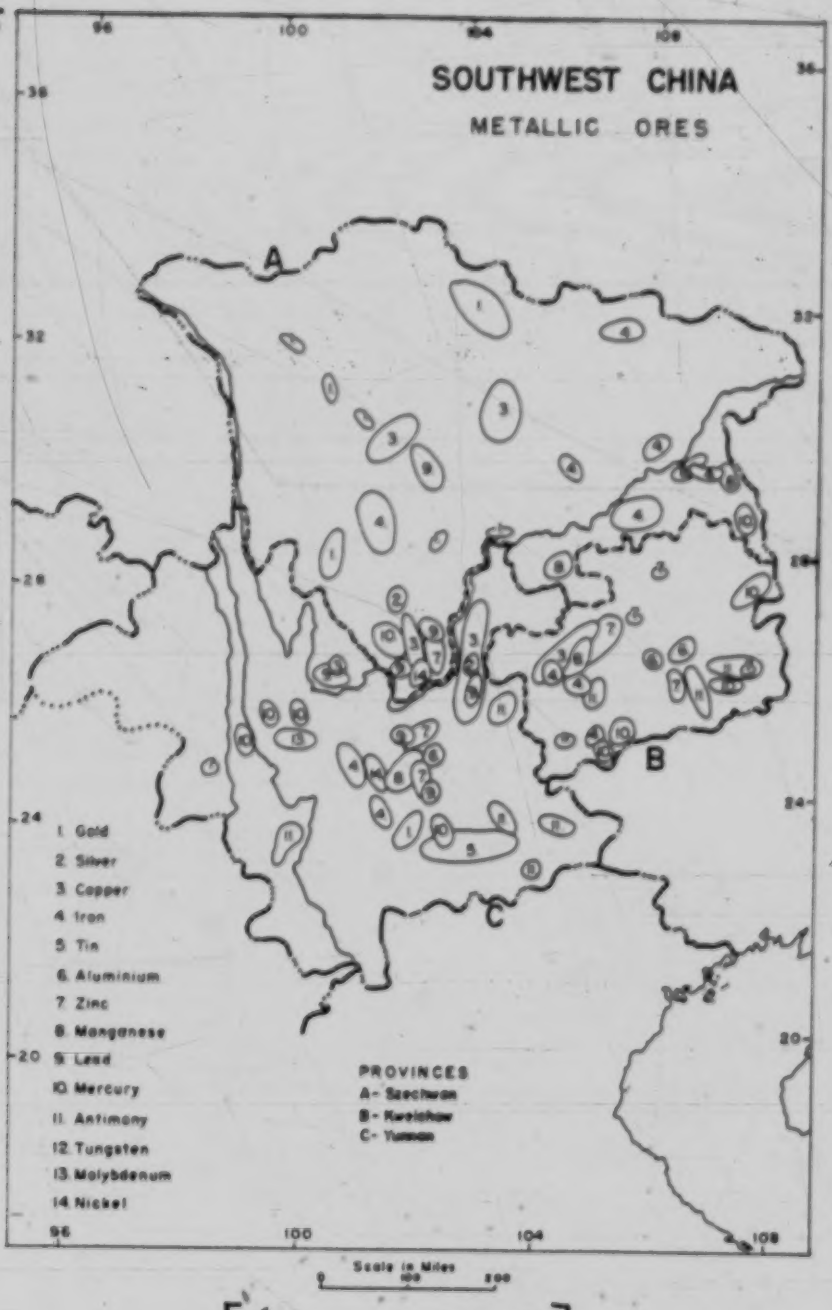
1:Stanford U. S-4, 5 1956 AF16 SW China AF16

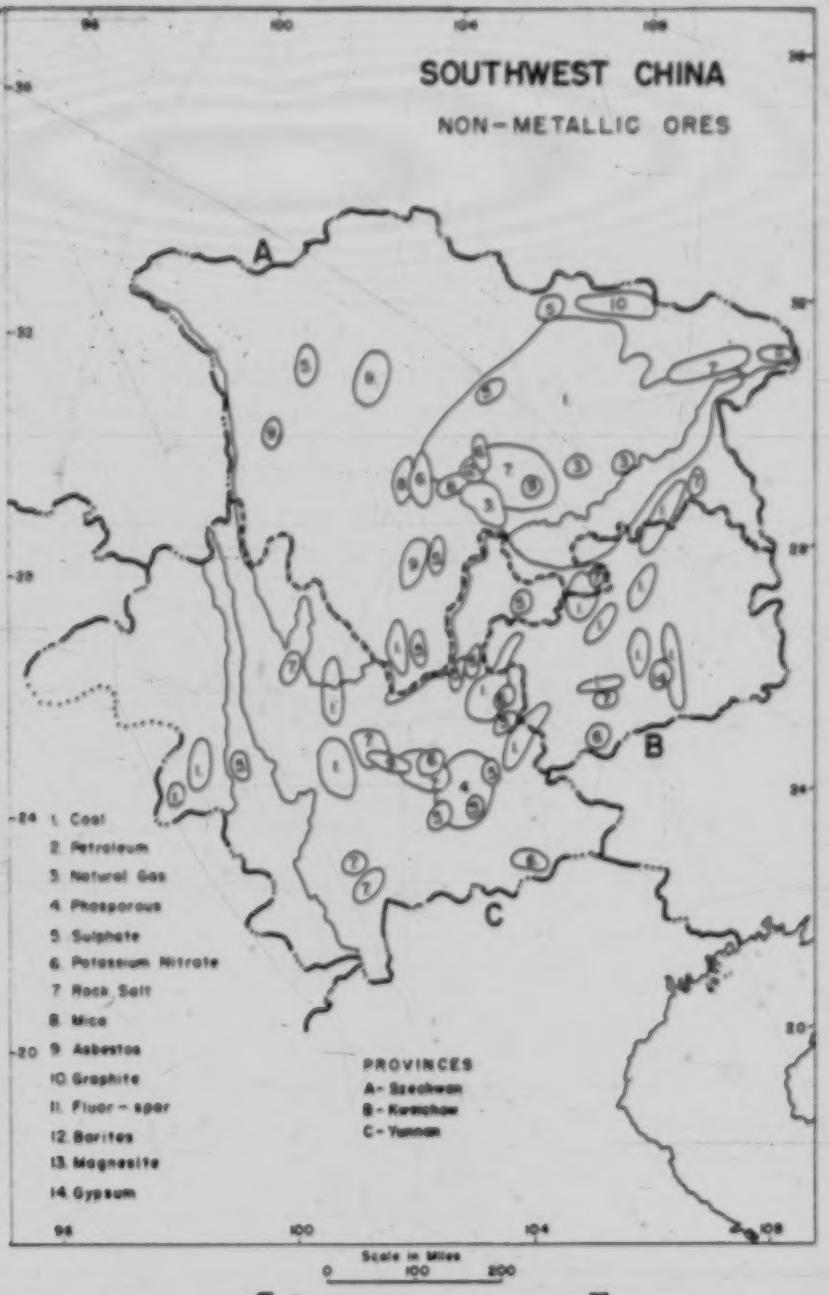
• 135



[facing p. 774 (a)]

1:Stanford U. S-4, 5 1956 AF16 SW China AF16

135



[facing p. 774(b)]

1:Stanford U, S-4, 5 1956 AF16 SW China
AF16

327 standard and narrow gauge rails for the construction and repair of railroads in the Southwest Region.

C. Production of Coal

316 135 In terms of the coal resources of the entire country, reserves and production in Southwest China are small (See Table 3).

316
•135

Table 3. China's Coal Production
(in 1,000 metric tons)

	1934		1946	
East China	1,619	(4.7%)	1,160	(6.8%)
South China	501	(1.5)	130	(0.8)
Southwest China	863	(2.6)	2,310	(13.5)
North China	16,876	(49.4)	7,177	(41.8)
Northwest China	487	(1.5)	1,409	(8.2)
Northeast China (Manchuria)	12,000	(35.0)	4,182	(24.4)
Central China	1,828	(5.4)	790	(4.6)

* Chinese Yearbook, 1944-1945, p. 684; The Statistical Yearbook of the Republic of China, 1948; and China Handbook, 1937-1945, pp. 398-90.

1:Stanford U, S-4, 5 1956 AF16 SW China
AF16

1:Stanford U. S-4, 5 1956 AF16 SW China
AF16

316 Szechwan Province has the largest known coal
135 reserve in the region, and Sikang the smallest. Geological data on coal reserves in Sikang are incomplete. Szechwan leads the provinces of the Southwest Region in the production of bituminous coal (See Table 4).

1;Stanford U; S-4, 5 1956 AF16 SW China AF16

Table 4. Estimated Coal Reserve in Southwest China*
(in million metric tons)

Province	Anthracite	Bituminous	Lignite	Total	Per cent of National Total
Szechwan	293	3,540	-	3,833	1.46%
Yunnan	77	1,542	694	2,313	.88
Kweichow	822	1,696	-	2,518	.96
Sikang	3	501	27	531	.20
Total - Southwest China				9,195	3.51%
- China, including Manchuria	45,281	216,021	4,012	265,314	100.00%

* Based on data published in China Handbook, 1937-1945, p. 389.

1:Stanford U. S-4, 5 1956 AF16 SW China
[redacted]
AF16

D. Production of Copper

135 Copper deposits are found in most of the provinces in China, but Southwest China has the greatest share of the nation's total reserve. According to studies made by the National Geological Survey of China in the 1940's, the estimate copper reserves and their geographical distribution are as follows:

Table 5. China's Estimated Copper Reserves* (in thousand metric tons)

Region	Province	Reserve
Southwest	Yunnan	270
	Sikang	261
	Szechwan	27
	Kweichow	178
Central-South	Hupeh	18
	Hunan (with Fukien)	200
North	Shansi	4
Northeast	Liaoning	5
Total		964

* China Handbook, 1937-1945, p. 393. Difference between total and sum of individual figures results when figures are founded to nearest whole number.

1:Stanford U. S-4, 5 1956 AF16 SW China
AF16

.328 Yunnan, Szechwan, and Sikang are centers of China's copper production. During the 1940s, several modern copper refineries using the electrolytic process were operating in Southwest China. They treated ore mined in the region and refined it to a product of 99.95 per cent purity. China's copper production during 1938-45, accounted for largely by the Southwest Region, was as follows:

Table 6. China's Production of Copper* (in metric tons)

Year	Production
1938	477
1939	1,886
1940	2,318
1941	1,591
1942	1,266
1943	500
1944	930
1945	1,179

* Statistical Abstract of the Republic of China, 1947, pp. 28-29.

E. Production of Antimony

•135 Another important mineral resource in the Southwest Region is antimony, of which

1:Stanford U. S-4, 5 1956 AF16 SW China
AF16

135 China has been the largest producer in the world. As shown in Table 7, about 14.7 per cent of China's total antimony reserve is in the Southwest Region, and 13.4 per cent of China's total antimony reserve is in the province of Kweichow.

Table 7. China's Estimated Antimony Reserves* (in metric tons)

Province	Reserves	
	Tonnage	Per cent of National Total
Szechwan	-	-
Yunnan	48,000	1.26
Kweichow	509,790	13.41
Sikang	-	-
Total -Southwest China	557,790	14.67
- China	3,802,850	100.00

* China Handbook, 1937-1945, p. 394.

2: Rock K-5 (1934-) 1947, AF16 Southwest China AF16

Our trail keeps to the east slope of the gorge and ascends to the end of the ravine, or rather its beginning, on a narrowing plain. Here stood a village, but nothing is left now except charred ruins, it having been burnt down by the bandits. We emerge into a red, hilly country, and here the Lang-k'ung River receives an affluent.

The trail follows the left bank of the stream along the foot-hills and by the village called Hsün-chien-ssu 巡檢司, thence across the gravelly stream-bed, and continues on the right bank between roses and Pyracantha bushes. We cross a gravelly plain to the base of a red hill, which we ascend to the top, at an elevation of 7,550 feet. Here, to the right of the trail, is a small but beautiful lake called Kan-hai-tzu 乾海子. We now descend between pine-covered hills to a plain on which is situated the hamlet of Ying-shan-p'u 應山舖, elevation 7,350 feet. To our right is a steep, rugged mountain mass cut up by deep ravines or chutes. It is a sacred mountain called Fo-kuang-chai Shan 佛光寨山 or simply Fo-kuang Shan;[43] half-way up the mountain is a cave said to hold 10,000 people. A temple, called Ling-kuang Ssu 靈光寺, is visible on the slopes; the temple was built in the first year of Wan-li (1573) by the village police chief Lü Meng-hsiung 呂夢熊.

From here we follow over the well-cultivated plain, wheat being the most abundant crop, past the villages of Wen-pi-ts'un 文筆村 and Ch'ang-ying 長營, until we finally reach the hamlet of San-ying 三營 (Three camps). It is a long, narrow village with a peculiar gate in the center. Elevation 7,500 feet. On this stretch we met long processions of Min-chia women carrying furniture, latticed Chinese doors and windows, baskets or huge stacks of straw hats, and — these were in the majority — huge juniper coffin-boards seven feet long, four inches thick, and three feet wide. These came from Pai-mang Shan 白芒山, many stages to the north, where there are large forests of immense junipers — *Juniperus wallichiana*. They are floated down the Yangtze to Shih-ku and are thence carried to Teng-ch'uan and by boat on the lake to Ta-li.

From San-ying it is five li to Niu-kai 牛街 (Cattle-market).

A short distance beyond San-ying is a limestone hill called Huo-yao Shan 火藥山 [44] (Fire medicine or powder mountain): it is about 300 feet high, with a pagoda (*wen-pi* 文筆) on the top. The rocks are full of holes and the entire hill is honeycombed; it is the only limestone hill in the immediate neighborhood. At its foot are boiling hot springs, the water being crystal clear as it boils and bubbles up (temperature 170° F.). Steam rises everywhere between the rice-fields and the people wash their clothing in the boiling pools. In February, 1935, this peculiar mountain suddenly erupted. A severe earthquake preceded the eruption, the noise emanating from the mountain sound-

[43] It is also called Fo-kuang-chai 寨 and I-nü Kuan 一女關 (Pass of a woman). The latter name has reference to a narrow slanting defile back of the mountain. It was in this cave that Chu-ko Liang, marquis of Wu 武, captured Meng-huo 孟獲. Later in the Ming dynasty in 1383, General Fu Yu-te 傅友德 suppressed a rebellion of native chiefs who fled into this cave. At that time 13,000 people in all were decapitated and 400,000 families of the native tribes made their submission. It was then that Li-chiang made its submission to the Ming, and the Mo-so were pacified.

[44] Also called Huo-yen Shan 火焰山 (Flaming Mountain).

2: Rock K-5 (1934-) 1947 AF16 Southwest China AF16

yao wei-yüan was abolished and a magistrate appointed in his stead. The boundary, where the district is surrounded by the four snow ranges, has not yet been delineated.

"It is believed that the border of the district extends east to Pen-tzu-lan, adjoining the Chung-tien and Ba-thang (Pa-t'ang) districts and the Yang-tze. In the north it extends to Pi-yung-kung 必用工, the Ch'a-li Hsüeh-shan 茶里雪山, and to Yen-ching on the Ssu-ch'uan (now Hsi-k'ang) border. The A-tun-tzu district according to Chinese records comprises about 1,000 square li, and 12,000 inhabitants. There is much snow and the climate is raw and cold. The inhabitants are mostly Tibetans and Mo-so [Na-khi]; a few Chinese, also Moslems and natives of Shensi several ten families, also reside there. There are in all four Hsiang 鄉 (suburban districts), viz., Mou-ting 茂頂 [also written Mu-ting 穆頂], A-tung 阿東, Pen-tzu-lan (Pong-tse-ra), and in the west Chiang-hsi 江西. In ancient days there were two native lieutenants, and two T'u-pa-tsung, who ruled over the peasants.

"Arable land is very scarce in the district, and dry grains only are grown. Therefore taxes which are 10 per cent in Wei-hsi, are only 8 per cent in A-tun-tzu. There are over 10 lamaseries in the district belonging to both the Red and Yellow sects. The Catholics are said to have over 100 believers. Of the inhabitants of A-tun-tzu half are lamas. Outside of the few merchants who reside in the town proper, the people are all farmers and shepherds. Salt is taken by them to Chung-tien and Wei-hsi and exchanged for victuals. The main products imported are tea and sugar, while musk, wool, felts and salt are exported. There are no craftsmen or laborers. Rich mineral deposits are found throughout the district. The town of A-tun-tzu possesses a yamen, a school, and a jail. As the inhabitants are ignorant of the Chinese language, and are unable to govern themselves, a Chinese magistrate was established."

(*Translated from manuscript notes attached to an unpublished A-tun-tzu district map in the Government Library in K'un-ming.*)

3. KHA-WA-KAR-PO RANGE (MOUNTAIN OF WHITE SNOW)

The finest mountain range in north-western Yün-nan is undoubtedly Kha-wa-kar-po (written Kha-wa-dkar-po or Khwa-dkar-po) which forms the Yün-nan—Tibet border and the western wall of the Mekong valley (in Tibetan, La Chhu, written gLa Chhu or bLa Chhu according to *Dict., Thib. Lat. Fr.*, p. 687).[9] It extends from north to south and consists of five main peaks of which the southernmost, Me-tse-mo or Yung-chih Hsüeh-shan, is the highest. Although it has never been actually measured I estimate its height to be 21,000 feet. Its Tibetan name Me-tse-mo (written sMad-rtse-mo) [10] means "Lower peak," but not in the sense of being lower in altitude, but as being the southernmost of the range. It stands out isolated towards the east of the main range and is the most beautiful peak of the entire chain, resembling an ice palace of a fairy tale, or an enormous mausoleum with gigantic steps and buttresses, all crowned by a huge, majestic dome of

2: Rock K-5 (1934-) 1947 AF16 Southwest China AF16
Sino-Tibetan Border AE3

ST
766
751

the village and give leprosy to his relatives; hence the custom of burying lepers alive. The burial over, all returned to their homes.

6. PAI-CHIO SILVER MINE

S
316
135

The one feature of interest in Pai-chio-pa and the Lang-ch'ü T'u-ssu's domain is the silver mine in Pai-chio Shan (Pai-chio Mountain). The Yung-pei Records, ch. 1, fol. 18b, have the following to say about this mine:

"The Pai-chio Mountain is in the district of Lang-ch'ü and borders on the district of the Chang T'u-ssu [Yung-pei district]; the mountain extends part-way into Ssu-ch'uan, that is into the magistracy of Yen-yüan. On the top as well as at the foot of the mountain there are outcroppings of silver ore. In the 11th year of Tao-kuang (1831), Sub-prefect Wu Chao-t'ang 吳兆棠 submitted a report which was approved, whereupon he began operating the mine and paid taxes to the government. The mine was called Tung-sheng ch'ang 東昇廠, also Pai-niu ch'ang 白牛廠. At that time they saw a white cow at that place, whereupon they obtained silver [the legend says that only as much silver as corresponds to the leg of a cow has been mined, meaning that there is a large amount still unmined], hence the name Pai-niu ch'ang (White cow mine). In the 25th year (1845) gold was found in the silver, which was separated from it. Mining is still going on to this day."

Mining operations have, however, ceased, not on account of lack of ore, but on account of the foul air in the mine, which prevents workers from remaining in it. They are unacquainted with ventilating methods.

In another part of the Yung-pei Records ch. 2, fol. 48a, it relates that after the mine had been opened they kept five to six boilers (池) or smelters going [the word *ch'ih* 池 stands for a container of liquids, but the Records do not state how much ore could be melted in one of them]. It does say, however, that out of every *ch'ih* from 50–60 Chinese ounces of silver were obtained when the ore was good, and never less than 10 ounces. After many years of mining the ore became less and less productive and in the end contained little silver.

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

233 Ponies, mules, cattle, sheep, and pigs are extensively reared, and in the colder places large herds of yaks are to be met with.

135 Mineral wealth too is not wanting in this corner of Yün-nan. In the neighbourhood of Wei-hsi T'ing there are mines of silver and copper, and just over the border of Ssŭ-ch'uan in the semi-independent state of Mi-li (lat. 28° 10′, long. 100° 50′) gold is found in some quantity.

278 224 Among other products of the Tibetan part of Yün-nan must be mentioned musk, skins and furs, rhubarb, and other Chinese medicines.

438 This corner of Yün-nan, however, owing to the sparseness of its population and its distance from trade centres, is not at present of great commercial importance, though wool, timber, and gold may in the future become important articles of trade.

133 Let us then now consider the rest of the province. The highest plains here are at an elevation of 8000 feet, while some of the river valleys in the south of the province are even below 2000 feet. But these extremes are exceptional. The great bulk of the plains of Yün-nan lie at an average of 6000 feet, with the hill tops rising some 3000 or 4000 feet above them.

132 The climate is excellent. In winter there are often frosts at night, but not of great severity, while in the daytime the weather is usually bright and pleasant. Snow falls in the plains only very occasionally and does not lie long. All through the dry season, which lasts from the beginning of November to the latter half of May, there is no unpleasant heat. From June to September inclusive is the monsoon, and rain falls heavily at times, with fine intervals of a few days. In these intervals the hottest weather is experienced, but in the higher plains the thermometer seldom rises above 85°. By October the main force of the rainy season has been spent, though some rain may still be expected. An occasional wet day or two there may be even in the dry season, but Yün-nan, except in its north-eastern corner, is free from the continual mist, clouds, and rain which are prevalent in Ssŭ-ch'uan in the winter.

137 The vegetation of the country naturally varies much in different parts of the province. The flat part of the plains

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

Sheep and goats are found in places all over the province, and in some districts in very large herds. The wool is sometimes made into felt rugs, but the Chinese do not know how to weave it into clothes. There is no reason why wool should not become an article of trade if better communications should make it saleable. Sheep are not sufficiently widely distributed to make mutton a common article of food anywhere.

Pork is the staple meat of Yün-nan, as of the rest of China, and pigs are kept everywhere both in towns and villages. It is a very poor man who cannot afford to mix some pork with his meal of rice. These two articles, with beans and cabbage, form the principal food of the Yünnanese.

As to the amount of livestock in the province I will not attempt to make any estimate. But as mules and ponies form nearly the only means of transport, buffaloes and cattle the only means of ploughing, and pigs the universal food of all classes, the numbers must be considerable. Moreover I do not think that the animals kept amount only to what is absolutely necessary for their owner. Many villagers own large flocks and herds, and the Yünnanese peasant is usually well off as far as possessions go, though he is not rich in money. The poverty of the poorer classes of the over-populated province of Ssŭ-ch'uan is almost unknown in Yün-nan.

We now come to mineral products. It is safe to say that there is no district in the province that does not contain mines, and with better communications Yün-nan might become one of the principal metal-producing countries of the world.

The most important mineral is *copper*, not only because copper mines are very numerous throughout the province, but because the *ch'ien* or cash, the only coin originally used by the Chinese, is made chiefly of this metal. The mines of Yün-nan supply a very large proportion of the copper used for coining, and as the value of the cash is about 400 to a shilling, and it is used throughout China, the demand for copper for this purpose alone is a very large one.

In the districts of Tung-ch'uan Fu and Chao-t'ung Fu are the mines which are at present most productive, but

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

copper mines are also worked in Yung-ch'ang Fu, Ta-li Fu, Ch'u-hsiung Fu, Ching-tung T'ing, Li-chiang Fu, Yung-pei T'ing, Wu-ting Chou, Ch'êng-chiang Fu and other districts.

Two copper-mining districts outside Yün-nan also deserve mention here, as they both lie within reach of the proposed railway. One of these is Wei-ning Chou in Kuei-chou province, a town through which the reconnoitred route actually passes. The other is Hui-li Chou, in the part of Ssŭ-ch'uan which runs down into Yün-nan to the north of the capital of the province.

Equally important with copper from a Chinese point of view is *silver*, for though the copper cash is the universal coin, lumps of silver weighed out in taels form in many parts of China the chief means of payment for larger sums than can be conveniently paid in cash.

This metal is if anything more abundant than copper, and one can seldom travel far in Yün-nan without seeing or hearing of silver mines. I doubt if there is any large district in the province which does not produce silver. Many of these mines are well worked, and Yün-nan supplies much of the silver used in other parts of China.

Iron is one of the commonest metals found in Yün-nan, and the tools and other things made from local iron are of good quality.

Lead is also a common metal, and *zinc* is mined in many places. Both these are used for mixing with copper to make cash.

Gold is not so widely distributed as the other minerals. The most productive mine is near T'a-lang T'ing (lat. 23° 25′, long. 101° 40′); this pays well in spite of the very primitive means employed for extracting the metal. Washing for gold is carried on in many parts of the Upper Yangtze and its tributaries.

The principal *tin* mine is in the south of the province at Ko-chiu, to the west of Mêng-tzŭ, but tin is also found in the Tung-ch'uan Fu district and probably in other places.

Among other products may be mentioned *gypsum*, which is used by the Chinese to mix with beans to make a sort of bean curd which is a common article of food; and

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

135● 316 [317]

sulphur and *alum*, both of which are extracted from hot springs which occur all over the province.

Salt also must not be forgotten. There are salt wells in many parts of Yün-nan, and the province supplies itself except the north-east corner which obtains its salt from Ssŭ-ch'uan. The working of the wells is a Government monopoly, so salt at present is not allowed to be imported from abroad[1].

Not least among the products of Yün-nan must be mentioned *marble*. From the quarries at Ta-li Fu is obtained a marble which is much used for tombstones and for ornamental work in houses. It is famous all over China, and with better means of transporting it to distant places the output would doubtless largely increase.

We now come to *coal*, the most important of all the products of the earth of Yün-nan, for on cheap fuel must largely depend the success of the mines. It is found in a great many places in the province, but varies much in quality. Some of it is very powdery and can only be used in the form of briquettes: in other places it is of good quality and can be obtained in large blocks. Even when the coal now in use is of inferior quality it does not follow that a better sort would not be found by mining deeper, for at present it is obtained principally from surface workings.

Coal is found in the neighbourhood of Ta-li Fu, and in several places between this town and Yün-nan Fu. Eastward from the capital it becomes still more abundant, and is found nearly all along the proposed railway line from here to the Yangtze. In the Hsüan-wei Chou district coal is almost the only kind of fuel that is used. Nor is it only near the line of the proposed railway that coal exists. It is mined in many places on the upper course of the Yangtze, and in several other districts of Yün-nan.

Of metals and of coal in Yün-nan it may be said that no examination of the mines has at present been made in a very detailed manner. If the railway is to be constructed it will be most essential that all mining districts anywhere within reach should be carefully examined, and a report made by experts as to the prospects of working them by machinery.

[1] For more details about the salt wells see p. 197.

823 The Basin has often been referred to by western writers as "the Eden of the Flowery Republic," or the "Garden of Asia." By the Chinese themselves, it is popularly called the "Tien Fu," which literally means the "Treasury of Heaven." Although these 241 433 names may appear exaggerated, they do suggest the agricultural richness and the amazing diversity of the products of the Basin. Normally, Szechuan Basin leads all China in the production of corn and rape. It holds second place as a producer of rice, potatoes, and silk; fifth place, as a producer of wheat; and sixth, as a producer of millet, kaoliang, and soy beans. The Basin has been for decades unchallenged as a producer of such internationally known products as tung oil, bristles, herbs, Cho Tsai (pickled vegetables), Wu Pei Tze, and Nanmu (lumber).

The agricultural richness of the Basin and the important role it now plays in China's present war effort are demonstrated by one significant fact. The Basin alone contributes about 60 per cent of the total food supply for the entire Chinese fighting force, comprising over five million men. The Basin is truly a granary of all free China.

314 433 In forestry land use, the Basin normally produces about a third of the total annual production of tung oil for all China. This product constitutes a critical cash crop for farmers in many parts of the Basin, particularly in the hilly east and southeast. At present tung oil occupies a vitally important position in the export trade of the Basin. It, alone, comprised about 65 per cent of the Basin's total export trade in 1940.

[388] Another important forestry product of the Basin is white wax. The Basin normally produces over 90 per cent of the total white wax of China. Although the economic value of this unique forestry product is not great, the spectacular snow-white color of the wax tree in the late Autumn adds much to the picturesqueness of the Basin's agricultural landscape.

[386] Lacquer derived from the varnish tree, has been famous in the Basin ever since the Han dynasty (206 B.C. to 220 A.D.). It still remains one of the Basin's most reputed products.

135 The variety and abundance of strategic minerals in the Basin is second only to its richness in agricultural and forestry products. Today the Basin leads all China in the production of brine salt. Its iron reserve ranks second and its coal reserve ranks third in the country, but it is at present the leading

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

producer of both these key minerals among all the provinces of free China. 135

While it is true that Szechuan Basin is undoubtedly the most self-sufficient and prosperous agricultural region of China, many phases of its present agricultural and forestry land use cannot be said to be wholly satisfactory from the standpoint of modern technology and scientific development. As a matter of fact, the backwardness of some of the practices is appalling. Drastic measures of improvement are urgently needed. 242 313

The efficiency of the Basin's present agricultural land use has been handicapped greatly by many natural and cultural factors. Among these are the traditional "Tung Shui Tien" system; the undependable nature and marginal character of the hilly agriculture in many parts of the Basin; the presence of large tracts of unreclaimed vacant land (particularly at the peripheral areas of the Basin); ignorance of modern scientific methods of seed selection and plant-breeding (from the irrigated alluvial plain rice to the small millet of the non-irrigated eroded soils of the upper hills); the insufficiency and failure of cotton-culture in many parts of the Basin; the periodic or aperiodic famine in the more hilly areas due to the lack of the more drought-resistant crops; the serious nature of soil-creep in many hilly areas; the failure to modernize silk-culture; the failure to cultivate and to experiment with native herbs; and above all, the lack of satisfactory and efficient irrigation system in many terraced fields of the more hilly areas. 242

In forestry land use, the most noticeable difficulties are: the lack of long-range and far-sighted forestry policy and lumber exploitation; the failure to cultivate and to experiment with tung trees; the absence of well-organized and modern-equipped plantations in tung tree production; the lack of standardization of tung tree products; and the serious hazards (due to long and difficult hauling) of transporting the wax-insects in the white-wax tree industry. 313

Transportation both within and without the Basin has been made difficult by the swift flow of many of the streams and the ruggedness of the topography. Among all the regional problems of Szechuan Basin, none is more important and more acute than the issue of transportation. The solution of this problem will promote the efficiency of agricultural and forestry as well as other forms of land use in the Basin. 489

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

much from their crops as otherwise they might have realized. The classical example is that of wheat during the world war I, when wheat was in great demand throughout the world at that time and was sold for 2.50 to 3.00 Yuan[1] per bushel in Shanghai. At Chungking, however, only 1,500 miles away from the latter port, a bushel of wheat was sold for only ten cents! There is an old saying in the rural areas here: "Pai li pu fang tsu," literally meaning "bulk (grain) is not sold one hundred li away." This reflects vividly the difficulty and high cost of transportation.

Another astounding example is that many orange growers in the To Valley often let their oranges rot in the field rather than pick them, because it is so difficult and so expensive to get them to market. On the other hand, only 800 moles away, at Hankow, imported oranges are sold for about a dollar (Yuan) for a half dozen.

Finally, also due to the same difficult transportation, it is tragic to see many farmers in the more remote hilly areas let their land lie idle for months on account of the high transportation cost of shipping bulky fertilizers, such as soy bean or tung oil cakes.

7. Mining and Manufacturing Patterns

Approximately less than 10 per cent of the population in the Szechuan Basin are engaged in the mining and manufacturing activities. The Basin's recent rapid development in mining and manufacturing has strengthened its position as a rich self-sufficient geographic region. In fact, mining and manufacturing largely supplement the agricultural and forestry pursuits, and thus, as we shall see later, help to bring forth an increasing efficient agricultural and forestry land-use in the Basin.

With the numerous metamorphic formations, volcanic intrusions, and the Jurassic-Triassic (coal and salt-brine bearing here) formations, particularly in the fringing and the anticlinal regions, the Basin's mineral deposits are abundant and varied. They include both metallic and non-metallic deposits, such as iron, copper, gold, silver, aluminum, salt, coal, petroleum, and asbestos. Among them, judging from the volume of present production, salt, coal, and iron are by far the most important. The

---

[1] One Yuan (dollar) in normal times (pre-war) has an exchange rate of approximately one-third of a United States dollar.

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

241 311 Moreover, on account of the high ground water-tables here, the drainage conditions on these trough lands are very poor. These trough lands are sometimes used for wheat, hemp, rice, rape, or kaoliang, depending upon water conditions. But the productivity of these marginal agricultural lands are, in general, very low.

The second principal source of agricultural land-use here is developed on the more gentle slopes of the numerous synclines in this area. Here the slopes are terraced into rice, wheat, or potato fields. The drainage conditions are, in general, better than those in the trough lands of the anticlines. Considerable portions of the cultivated fields are used for Ta ma (hemp) and Tso Tsai (vegetable) cultures which are the two most spectacular agricultural products of this area.

314 The most outstanding feature of this agricultural area, as its name suggests, is the predominance of the forestry product, the tung oil. On the steep slopes or at the edge of the anticlines, where the soils are extremely shallow, great numbers of tung trees are planted. Especially during the past decade, stimulated by the increasing demand, the plantation of tung trees has been grown in leaps and bounds. This area alone now contributes about three-fourths of the total production of tung oil production of all the Basin. In one district, Ning-shui alone, it produces about 52 per cent of the total tung tree production of the Basin. This factor has increased greatly the population-support capacity for this agricultural area and also helps to explain the presence of a few detached high population density areas here (Fig. 10).

•135 Another interesting characteristic of this agricultural area is that here lies about 65 per cent of the total coal reserve (Pa-hsien and Chiang-peh) and about 45 per cent of the total iron reserve (Chi-chiang and Nanchuan) of the whole Basin.[1] This remarkable fact suggests that in the future days to come, this agricultural area may abandon its present modest pursuits in agricultural and forestry production, and will soon take an unchallenged leadership in the growing industrial and manufacturing development of the Basin.

---

[1] W. C. Chang, "The Iron and Coal Resources of Szechuan," Szechuan Monthly, V, No. 5 (1934), 35.

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

5. The Mixed Farming Area of the Southwestern Basin

Among all the principal agricultural regions of the Basin, the mixed farming area of the southwestern Basin (Fig. 24) is the most interesting. Here lies an area like a synthesis of all the above four areas. Besides its own unique quality, as we shall see shortly, this area possesses some characteristics of each and every one of the above four agricultural areas. This condition is true in topography, soil, crop association, and other aspects.

In topography, for instance, this area possesses some of the anticlinal ridges (but lesser in magnitude) like the eastern Basin; some irregular hills like the northern Basin; and some broad plains (in smaller extensions) like the Chengtu Plain, or rather, like the lower To-Fou valleys. However, unlike all the above four agricultural areas, the absolute relief here is, on the whole, the lowest, averaging about 300 meters above sea level.

In soil, this area is also a miniature model of the above four agricultural areas. The usual purple-brown soils of the northern Basin, the limestone soils (old and young yellow earths) of the eastern Basin, and the rich alluvial soils of the Chengtu Plain and To-Fou valleys are all present here (Fig. 9).

In agricultural land-use and crop association this area has the greatest variety of products. The broad river valleys of the Min (lower) and Yangtse furnish fertile fields for rice, sugar-cane, and orange groves. The more hilly lands, terraced in minute steps, are used for corn, wheat, rape, hemp, barley, potato, beans, and other crops. Unlike the other four areas, corn is the most predominant crop here. Moreover, on the steep slopes of the high anticlines, or on other more hilly areas, numerous forestry products, such as tung tree, tea, white wax, mulberry trees, and various kinds of bamboo, are found. Especially, the bamboo products and white wax are the most famous.

Above all, another interesting feature of this area is the bona fide tropical character of its agricultural and horticultural products here. Climatically, with the exception of the southeastern highlands of the Basin, this area is the warmest among all the agricultural areas of the Basin (Fig. 24). Such well known tropical products as Li Chi, Lun yen, bananas, and palm vegetation are found here.

Another special feature of this area is the difference in its water use. Like Chengtu Plain this area is endowed with

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

312 rich water supply by the Yangtse, the Min, and other rivers. Numerous channels are built here, for instance, such as the Wu Tung-chiao and Chien Wei districts. But contrary to the practice of Chengtu Plain, and for reasons unknown, very few of these channels are used for irrigation purposes. Instead, they are principally for transportation use.

●135 Other interesting features of this agricultural area include its well-balanced endowment with mineral resources. Neither like the Chengtu Plain area of western Basin--where little or no mineral deposits are found--nor similar to the anticlinal areas of the eastern Basin--where is located the largest concentration of the Basin's mineral deposits, especially coal and iron--this area is rather well-balanced in various kinds of mineral deposits. In fact, this area is reasonably rich in every one of the strategic minerals, including salt, coal, iron, petroleum, copper, gold, and aluminum. Especially the salt production is the richest and the most important at present (Fig. 20).

241 In agricultural richness and productivity, this agricul-
433 tural area of southwestern Basin, as a whole, compares favorably with that of the specialized commercial agricultural area of the lower To-Fou valleys. This fact is evidenced by the fine, well-kept farmsteads here (Fig. 34). In terms of population density, this area also stands out as one of the five high densely populated areas of the Basin (Fig. 10).

E. Agricultural Products

241 The Szechuanese commonly claim that anything which is produced on earth may be found in the Basin. At least it is safe to say that there is scarcely an article grown in China which is not produced here in abundance. First of all, the summer field crops include rice, corn, sugar-cane, tobacco, potato, millet, kaoliang, cotton, beans of all kinds, and a great variety of vegetables and fruits. The winter crops include principally wheat, rape, beans, peas, and many others.

1. Common Food Crops

243 a) Rice.--Rice (oryza sativa) is the master crop of the Basin. It normally occupies 43,000,000 mow, or 42 per cent of the